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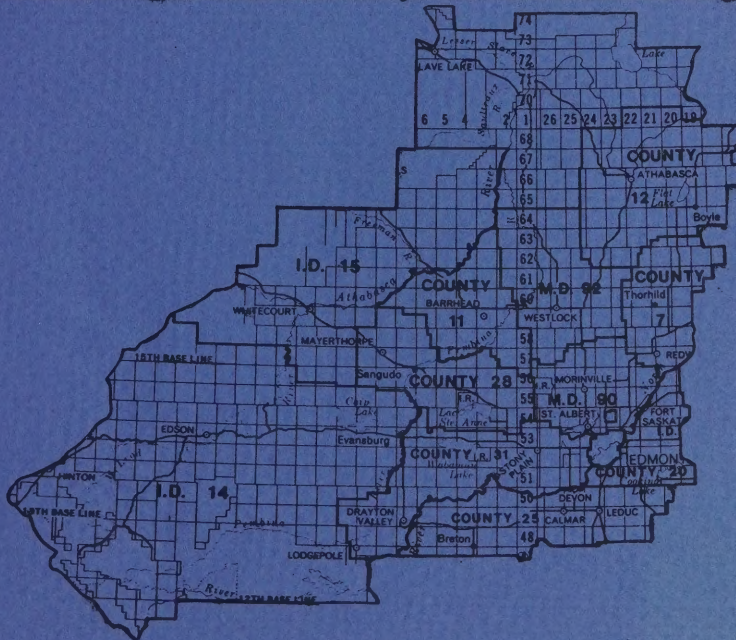
# COSTS AND RETURNS

## GRAIN SILAGE

100 ACRES

320 ACRE FARM

STRATHCONA - LEDUC COUNTIES

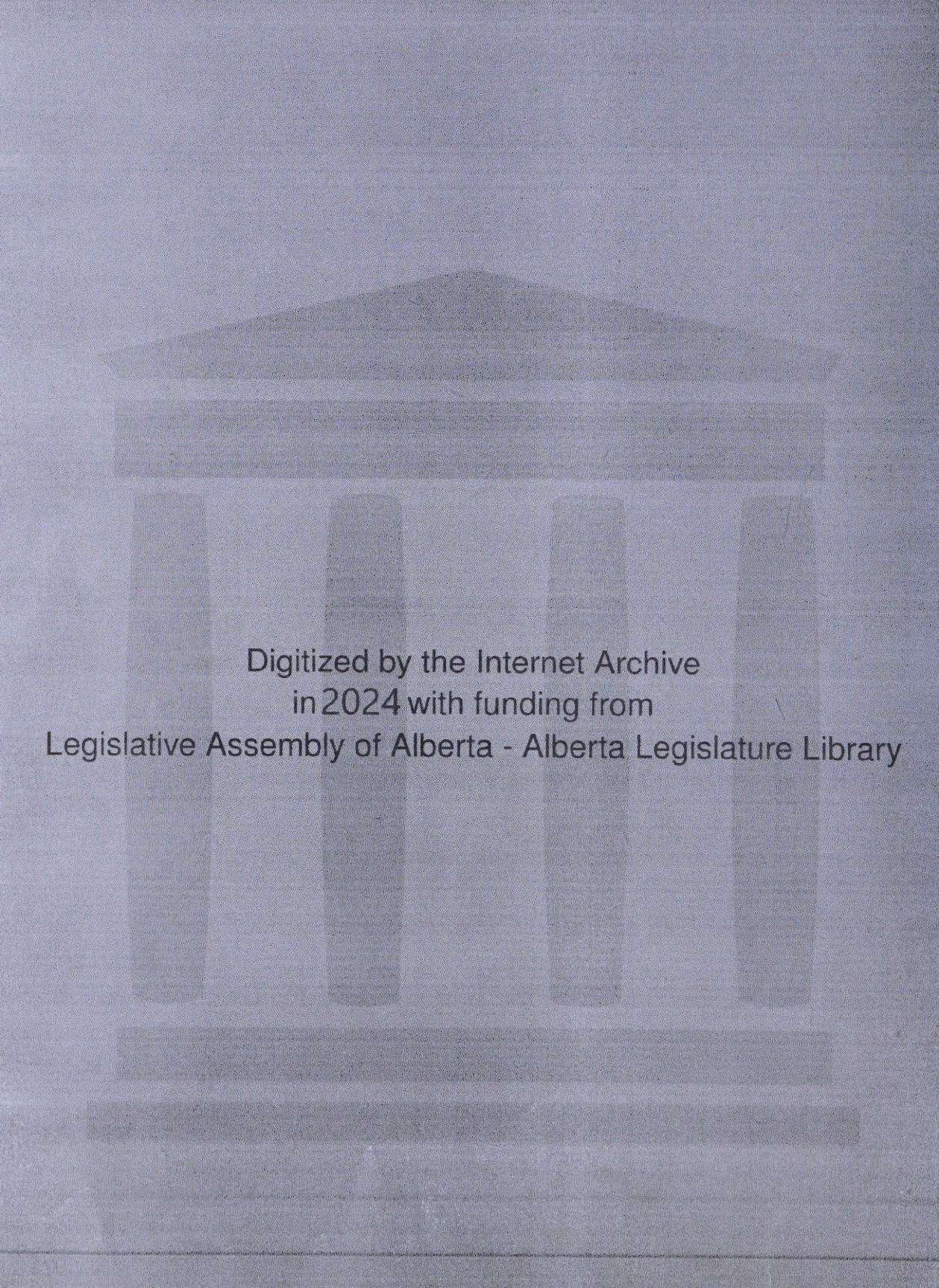


# NORTH WEST ALBERTA

MARKETING DIVISION - ALBERTA DEPARTMENT OF AGRICULTURE







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A CONSENSUS OF COSTS & RETURNS

FOR

GRAIN SILAGE PRODUCTION

100 Acres of Silage

Strathcona & Leduc Counties

By

Richard S. Andersen

Regional Farm Economist

The author wishes to acknowledge the assistance of the farmers in the Leduc and Strathcona counties who provided the basic data; Don Young and Don Christensen, D. A.'s of the respective counties who helped gather the data and assisted in the preparation of this report.



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## INTRODUCTION

Today's farming demands that cost and return information be available for all alternatives which the producer could consider when planning future production. Narrowing profit margins have forced the farmer to keep a close eye on all production costs and expected returns. This report provides an estimate of the costs and returns of producing grain silage based on the consensus of a group of farmers in the Edmonton and Leduc districts.

## OBJECTIVES

This report was prepared to provide an estimate of costs of production and the expected returns from a 100 acre oats/barley silage system. Such information can be an important guide in decision-making, but the reader should keep in mind that costs vary between producers because of differences in land and cultural practices. The farmer's own records are essential to determine what it actually costs to produce a crop on his particular farm.

This report can be useful for management decisions:

1. In selecting the enterprise or crop rotation yielding the highest returns.
2. In determining the amount of cash required to operate during a season.
3. In determining the amount of time expected to be spent on an enterprise.
4. For projecting the expense and income when considering new investments requiring credit.
5. In determining how the expenses and receipts should be shared in rental arrangements.
6. To compare to actual costs incurred in your farming enterprises.





## SOURCE & METHOD OF DATA COLLECTION

Following the expression of local interest, a number of producers were contacted and asked to attend a one-day workshop at which they felt typically represented their production methods. The C. R. D. (Consensus Research Data) approach relies on this group participation to arrive at a consensus of opinion on production techniques, investment levels and costs. The data collected represents typical or most representative costs and returns rather than averages.

Staff from the Alberta Department of Agriculture are present at the workshops to guide the discussion and assist in the collection of data. After the raw data is assembled at this meeting, further calculations and documentation are carried out. Each producer who participates at the workshop has the opportunity of reviewing the material prior to publication.

## ASSUMPTIONS SPECIFIC TO THIS STUDY

1. The farm consisted of 320 acres in the following rotation:

Silage	100
Grain	150
Forage	50
Native Pasture	20

2. Annual use of machines was based on the above cropping pattern.
3. Yield per acre was based on averages expected by the producers with the inputs and operations described in the cost operations:

<u>Crop</u>	<u>Yield</u>	<u>Value</u>
Grain Silage	6 Tons (wet basis)	\$7.00/ton





4. Seeding rate and estimated cost:

<u>Crop</u>	<u>Rate</u>	<u>Price</u>	<u>Cost</u>
Barley	3/4 bu./acre	\$1.25/Bu.	\$ .94/acre
Oats	1 3/4 bu./acre	\$1.00/Bu.	\$1.75/acre

5. Fertilizer rate and cost:

<u>Type</u>	<u>Rate</u>	<u>Price</u>	<u>Cost</u>
34-0-0	150 lbs/acre	\$68.00/ton	\$5.10/acre
11-48--	50 lbs/acre	\$105.00/ton	\$2.65/acre

6. Weed control costs:

<u>Type</u>	<u>Rate</u>	<u>Price</u>	<u>Cost</u>
MCPA	6oz/acre	\$0.08/oz	\$0.48/acre

7. Value of land \$175/acre; and taxes at \$2.25/acre.

8. Interest rates: Machinery 7½%; Real Estate 7%.

9. Labor: \$2.50/hour - all labor including owner's and hired.

10. Hauling based on total miles required to haul silage from field to silo.

11. Tractor and machine operating costs are based on information provided by the Alberta Department of Agriculture.

12. Storage structure used was a concrete silo with 600 ton capacity.

13. Storage costs do not reflect costs for visible and invisible silage losses.

14. Harvest and operator labor costs were adjusted linearly for yield variations above and below the 6 tons per acre as reported in Table B. For example, the costs for 7 tons per acre were calculated as follows:

$$\text{Cash Harvest cost/acre} = (7/6) \times \$6.92 = \$8.07$$

$$\text{Operator's Labor cost/acre} = (7/6) \times \$1.67 = \$1.95$$





TABLE 1

Summary of Consensus Report  
Costs and Returns at 6T/Acre Yield

	<u>Per Acre</u>	<u>Per Ton</u>
Cash Cultural Costs	14.14	2.36
Cash Harvest Costs at 6T/Acre	6.92	1.15
Cash Overhead Costs	2.96	0.49
Total Cash Costs	<u>24.02</u>	<u>4.00</u>
Non-Cash Overhead	50.11	8.35
Operator's Labor at 6T/Acre	2.26	0.38
Total Costs	<u>76.39</u>	<u>12.73</u>
Expected Returns ( 6 Tons @ \$7.00 )	42.00	7.00
Gross Cash Margin	17.98	2.86
Returns to Risk and Management	-34.39	-5.73
Return to Operator's Labor, Risk and Management	-32.13	-5.36
Return to Land, Operator's Labor, Risk & Management	-19.88	-3.31





TABLE 2

Gross Returns and Costs Per Acre

At Various Yields and Prices

Crop Area	Grain Silage Strathcona/ Leduc	Yield Ton Per Acre						
		-30%	-20%	-10%	Average	+10%	+20%	+30%
		4.2	4.8	5.4	6	6.6	7.2	7.8
Price per Ton								
	6.00	25.20	28.80	32.40	36.00	39.60	43.20	46.80
	6.25	26.25	30.00	33.75	37.50	41.25	45.00	48.75
	6.50	27.30	31.20	35.10	39.00	42.90	46.80	50.70
	6.75	28.35	32.40	36.45	40.50	44.55	48.60	52.65
	7.00	29.40	33.60	37.80	42.00	46.20	50.40	54.60
	7.50	31.50	36.00	40.50	45.00	49.50	54.00	58.50
	8.00	33.60	38.40	43.20	48.00	52.80	57.60	62.40
	8.50	35.70	40.80	45.90	51.00	56.10	61.20	66.30
	9.00	37.80	43.20	48.60	54.00	59.40	64.80	70.20
	Cash Cultural Costs	14.14	14.14	14.14	14.14	14.14	14.14	14.14
	Cash Harvest Costs	4.84	5.54	6.23	6.92	7.61	8.30	9.00
	Cash Overhead Costs	2.96	2.96	2.96	2.96	2.96	2.96	2.96
	Total Cash Costs	21.94	22.64	23.33	24.02	24.71	25.40	26.10
	Non-Cash Overhead	50.11	50.11	50.11	50.11	50.11	50.11	50.11
	Operator's Labor	1.57	1.81	2.03	2.26	2.49	2.72	2.95
	Total Costs	73.62	74.56	75.47	76.39	77.31	78.23	79.16







Date November 29/71

CROPS &amp; FORAGE

Reg. Ec. R.S. Andersen

Don Young  
D.A. Don Christensen

County Strathcona/Leduc

Grain Silage  
(Crop)

100  
(Acres)

[illegible]





- 7 -

- 2 -

PRODUCTION COSTS  
CROPS & FORAGE

821-A

				(10) Total Cost Per Acre \$
TOTAL CASH COSTS PER ACRE (821-A, page 1), columns 5 + 6 + 10				24.02
AV. INVESTMENT PER ACRE TO STUDY CROP		FIXED COST PER ACRE		
Item	Per Acre	Depreciation	Interest	
Land	\$ 175	\$ --	\$ 12.25	12.25
Crop Supplies	5	.08	.13	.21
Buildings	75	3.00	5.25	8.25
Equipment	168	19.53	10.15	29.40
Total				
			NON-CASH OVERHEAD	50.11
			OPERATOR'S LABOR	2.26
TOTAL NON-CASH COSTS PER ACRE				52.37
(A) TOTAL COSTS PER ACRE				76.39
- Operator's Labor				
(B) = Total Cost less Operator's Labor			\$ 74.13	
- Interest on Land				
(C) = Total Cost less Operator's Labor and Interest on Land			\$ 61.88	
(D) EXPECTED GROSS RETURNS PER ACRE				42.00
RETURNS TO OPERATOR'S LAND, LABOR AND MANAGEMENT (D-C)				-19.88
RETURNS TO OPERATOR'S LABOR AND MANAGEMENT (D-B)				-32.13

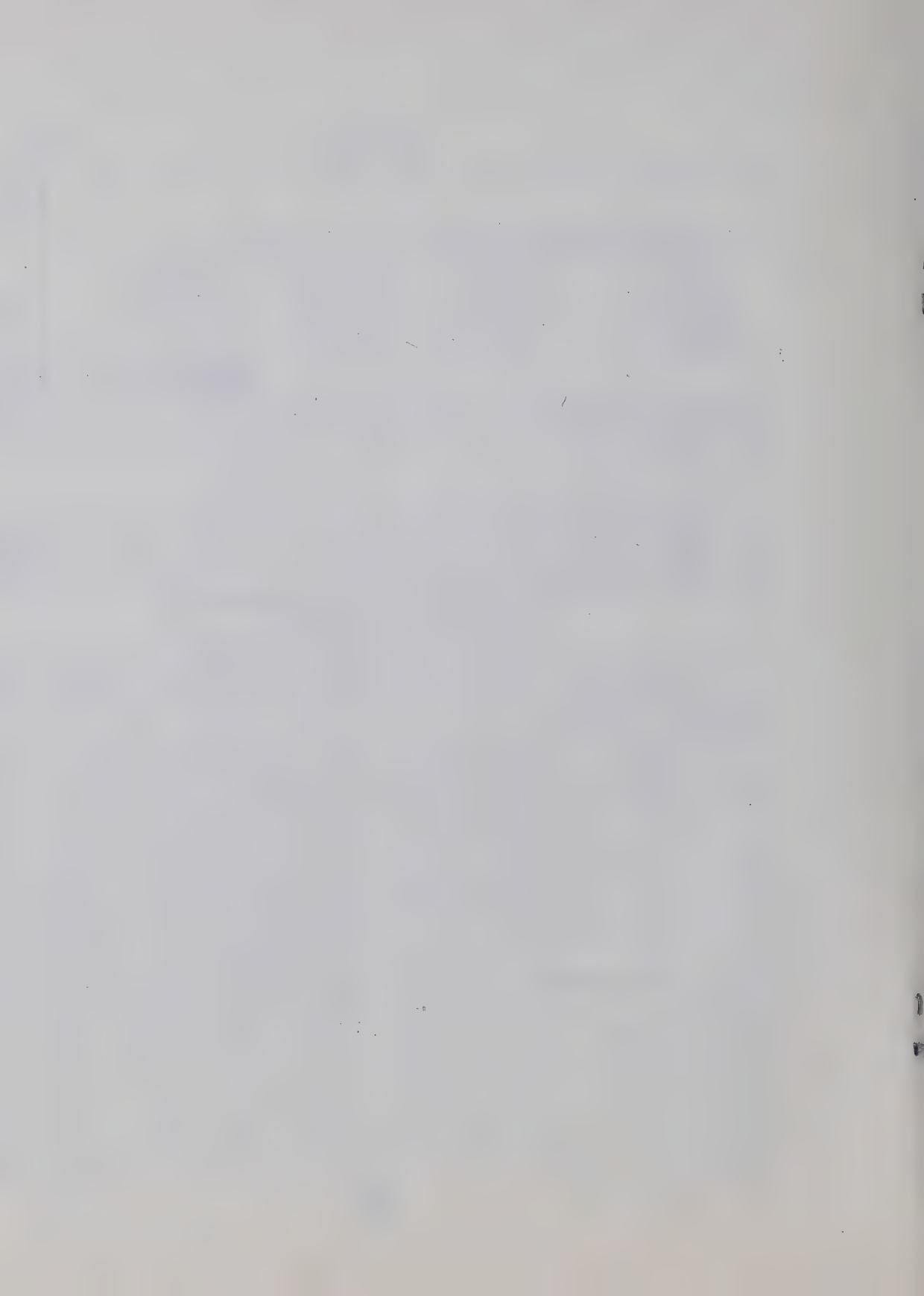
Table B

RETURNS PER ACRE TO OPERATOR'S LAND, LABOR AND MANAGEMENT  
AT VARIOUS YIELDS AND PRICES

COSTS PER UNIT (e.g. Bu.) AT VARIOUS YIELDS

Crop <u>Grain Silage</u>		Yield Ton Per Acre						
Area <u>Strathcona/ Leduc</u>		-30%	-20%	-10%	Average	+10%	+20%	+30%
	Price per <u>Ton</u>	4.2	4.8	5.4	6	6.6	7.2	7.8
RETURNS PER ACRE	6.00	-34.60	-31.70	-28.89	-25.88	-22.97	-20.06	-17.16
	6.25	-33.55	-30.50	-27.44	-24.38	-21.32	-18.26	-15.21
	6.50	-32.50	-29.30	-26.09	-22.88	-19.67	-16.46	-13.26
	6.75	-31.45	-28.10	-24.74	-21.38	-18.02	-14.66	-11.31
	7.00	-30.40	-26.90	-23.39	-19.88	-16.37	-12.86	- 9.36
	7.50	-28.30	-24.50	-20.69	-16.88	-13.07	- 9.26	- 5.41
	8.00	-26.20	-22.10	-17.99	-13.88	- 9.77	- 5.66	- 1.56
	8.50	-24.10	-19.70	-15.29	-10.88	- 6.47	- 2.06	2.34
	9.00	-22.00	-17.30	-12.59	- 7.88	- 3.17	1.54	6.24
COSTS PER TON	Cash Cultural Costs	3.37	2.95	2.62	2.36	2.14	1.96	1.81
	Cash Harvest Costs	1.15	1.15	1.15	1.15	1.15	1.15	1.15
	Cash Overhead Costs	.70	.62	.55	.49	.45	.41	.38
	Total Cash Costs	5.22	4.72	4.32	4.00	3.74	3.52	3.34
	Non-Cash Overhead	11.93	10.44	9.28	8.35	7.59	6.96	6.42
	Operator's Labor	.38	.38	.38	.38	.38	.38	.38
	Total Costs	17.53	15.65	13.98	12.73	11.71	10.86	10.14





EQUIPMENT	Size	Cost Price	Salvage Value	All Crops		Study Crop		Life Yrs.	Annual Costs		Annual Deprec.	Study Crop		Acres/Hour	Cash Costs/Hour	
				Coverage Acres	%	Coverage Acres	%		Deprec.	Int.*		Int.*	Power H.P.		Fuel	Repairs Total**
H.D. Cultivator	12'	\$ 1500	\$ 150	500	40	200	40	15	\$ 36	\$ 25	\$ .36	\$ .25	70	5.0	\$ --	\$ .17
Double Disc	12'	1800	180	250	100	100	40	10	65	30	.65	.30	70	4.5	--	.43
DD Press Drill	12'	2400	240	250	100	100	40	20	43	40	.43	.40	60	5.5	--	.36
Harrow Diamond	30'	850	85	500	200	200	40	20	15	14	.15	.14	60	17.00	--	.17
Sprayer	40'	650	65	250	100	100	40	20	12	11	.12	.11	40	20.00	--	.40
Swather S.P.	14'	6000	600	250	100	100	40	10	216	99	2.16	.99	--	7.00	.76	1.13
Harvester	Med	3500	350	100	100	100	100	5	630	144	6.30	1.44	70	1.50	--	.75
Silage Wagon	5T	2500	250	100	100	100	100	15	150	103	1.50	1.03	40	.75	--	.43
Silage Wagon	5T	2500	250	100	100	100	100	15	150	103	1.50	1.03	40	.75	--	.43
Blower, Pipes,																
Spreader		1500	150	100	100	100	100	15	90	62	.90	.62	60	1.50	--	.48
Tractor 70 HP D		10000	3000	222	111	50	10	10	350	244	3.50	2.44	70	--	.93	.33
Tractor 40 HP G		6000	1800	375	75	20	12	12	70	58	0.70	0.58	40	--	1.00	.28
Tractor 60 HP D		9000	2700	355	71	20	10	10	126	82	1.26	0.82	60	--	.76	.33

Interest on Equipment 7 1/2 %

\* Includes tractor complement where applicable.

FIXED COSTS TO STUDY CROP

Grain Silage (Crop)

LAND, BUILDINGS, EQUIPMENT, ETC.	Cost Price	Average Value	% to Crop	Life Yrs.	Fixed Costs on 100 Acres		Total
					Deprec.	Other	
Land (— Years)	\$ 175000	\$ 175000		XX	\$ 1225.00	\$	\$ 1225.00
Supplies, Shop, Tools		500	33	XX	8.33	.75	21.58
Buildings Concrete		7500	100	20	300.00		825.00
Equipment		16827	XX	XX	1953.00	22.50	2990.50
TOTAL					2261.00	23.23	5062.25

Interest on land, bldgs. 7 %











